SHARP Service Manual

SM-1144H
SM-1144HB

INTEGRATED
STEREO AMPLIFIER

MODEL
SM-1144H
SM-1144HB

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

SPECIFICATIONS

GENERAL DESCRIPTION

Power source:	a.c. 110/220/240V. 50/60Hz
Power consumption:	250W
Semiconductors:	1-IC (Integrated circuit) 8-Transistor 7-Diode 1-LED (Light Emitting Diode)
Dimensions:	Width: 408mm Height: 134mm Depth: 265mm
Weight:	6.5kg

MAIN AMPLIFIER

Circuit:	Differential amplifier, semicomplementary system, OCL (Output Capacitor-Less)
Music power output (1kHz):	2 x 50W/4 ohms, Both channels driven, 0.8% distortion 2 x 37W/8 ohms, Both channels driven, 0.8% distortion
Continuous power output (at 1kHz):	2 x 35W/4 ohms, Both channels driven, 0.8% distortion 2 x 27W/8 ohms, Both channels driven, 0.8% distortion
Intermodulation distortion:	0.08% at 5W output
Damping factor:	more than 30 (at 1kHz, 8 ohms)
Power bandwidth:	10Hz ~35kHz (4 ohms, Both channels driven)

PRE-AMPLIFIER

Circuit:	Direct coupled equalizer circuit 'CR' type tone control
Input sensitivity and input impedance:	
PHONO:	3mV/50k ohms
AUX/TAPE 2:	150mV/50k ohms
TUNER:	150mV/50k ohms
TAPE 1:	250mV/50k ohms
Output level and loaded impedance:	
TAPE REC:	30mV/80k ohms
Phono overload:	200mV (RMS, 1kHz, 0.5% THD)
RIAA curve deviation:	30Hz ~15kHz ±0.5dB
Frequency response:	10Hz ~70kHz ±3dB (AUX.)
Tone control:	
Bass:	±8dB at 100Hz
Treble:	±10dB at 10kHz
Rumble filter:	−3dB at 30Hz, 6dB/oct

Specifications of this model are subject to change without prior notice.

SHARP CORPORATION OSAKA, JAPAN

LAYOUT OF FRONT PARTS (Figure 1)

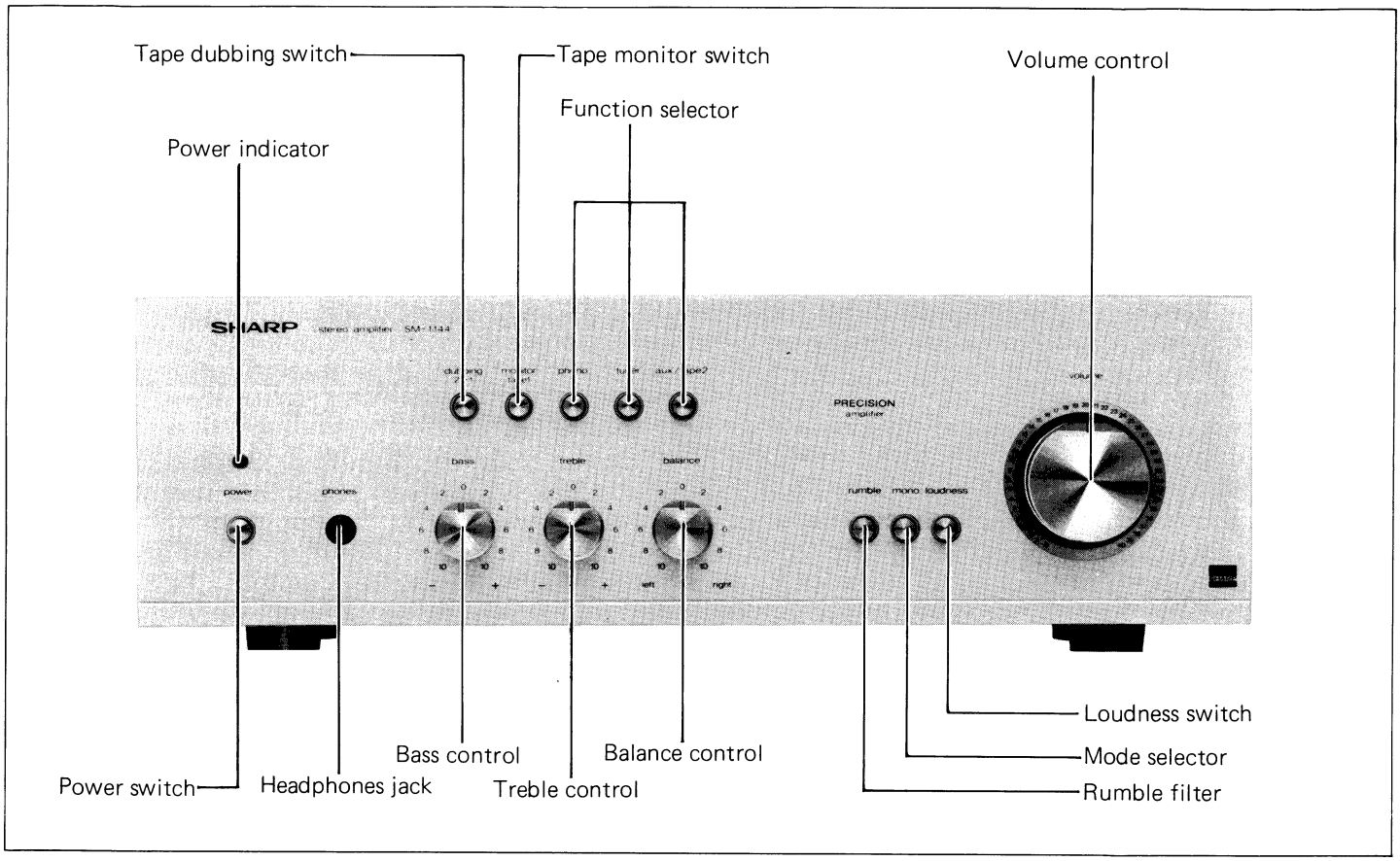


Figure 1

LAYOUT OF REAR PARTS (Figure 2)

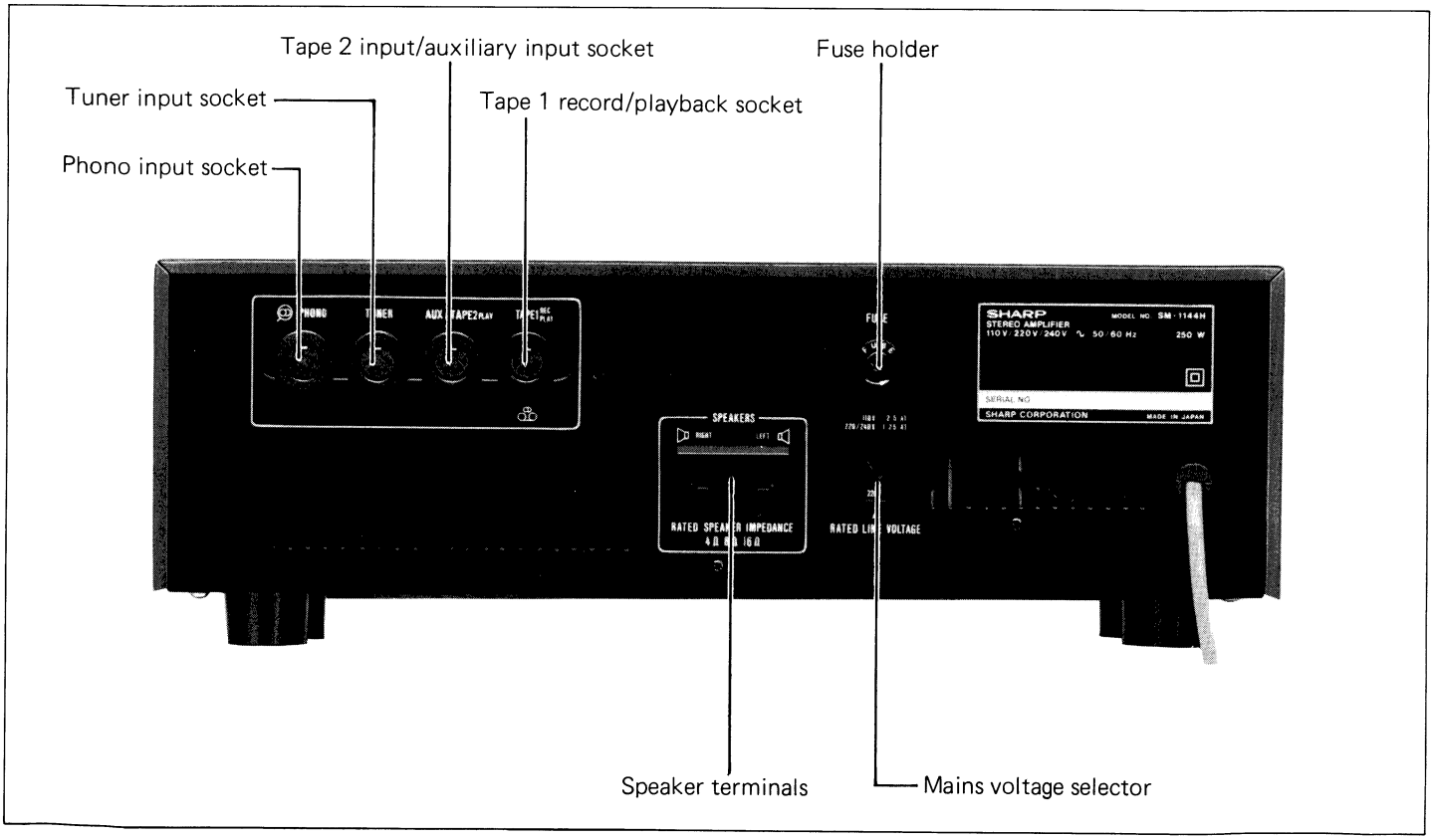


Figure 2

DISASSEMBLY (Figure 3)

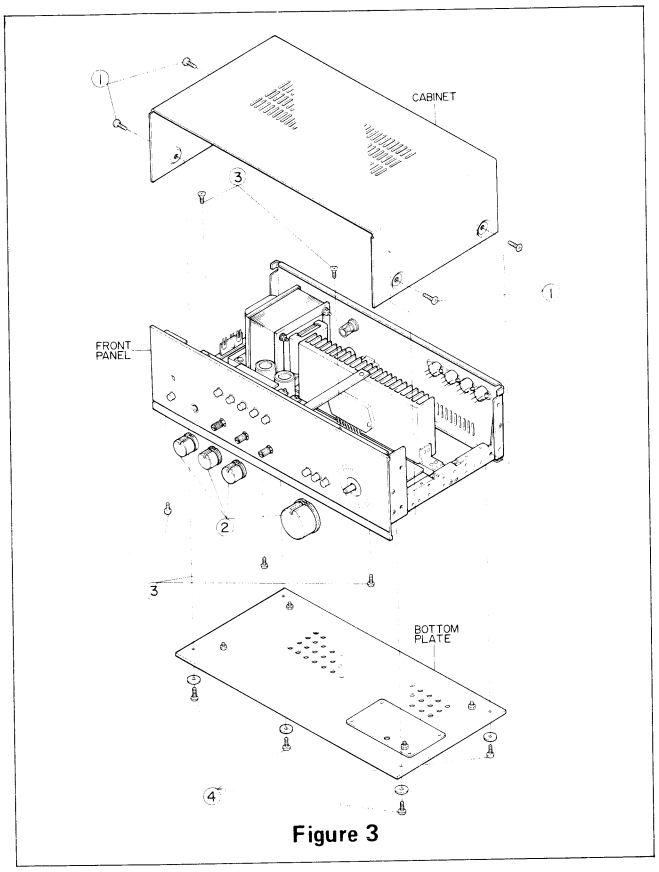


Figure 3

- HOW TO REMOVE THE CABINET:
  Remove the 4 screws ① retaining the cabinet (2 screw each in right and left) and lift up the cabinet to remove it.
- HOW TO REMOVE THE FRONT PANEL:
  Draw out the ④ knobs ② from the front panel and remove the 5 screws ③ retaining the front panel. Then pull the front panel toward you to remove it.
- HOW TO REMOVE THE BOTTOM PLATE:
  Turn over the set, remove the ④ screws ④ retaining the bottom plate and lift up the bottom plate to remove it.

PREPARATION FOR USE

VOLTAGE SELECTION (Figure 4)

Check the preset voltage before connecting the AC cord plug to an wall outlet. If the setting is different from your local supply AC voltage, the selector must be reset as follows. Rotate the voltage selector by using a screwdriver so that your local voltage number can be seen.

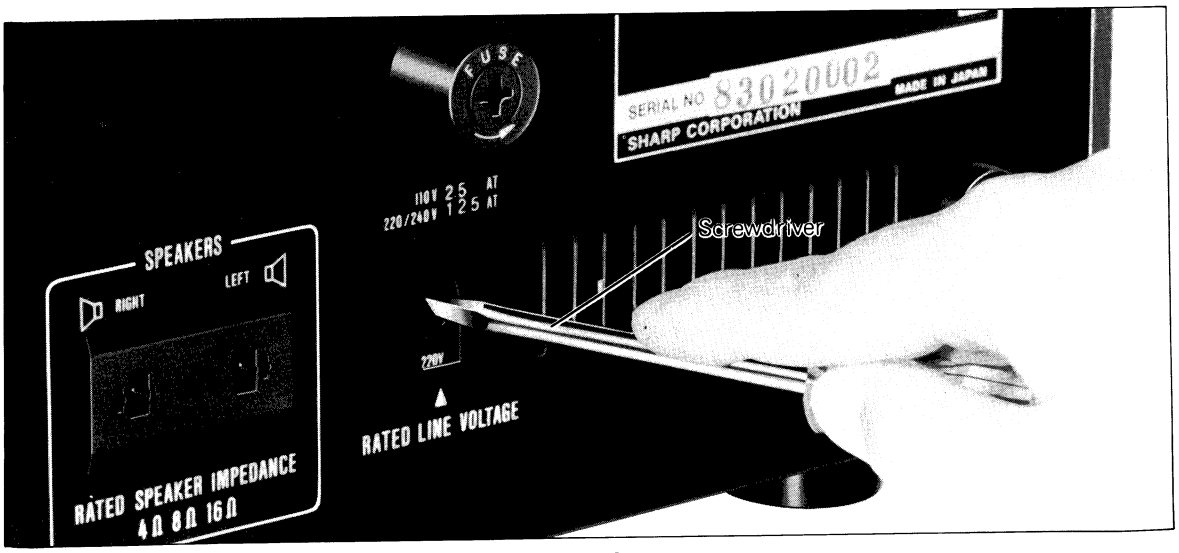


Figure 4

BLOCK DIAGRAM

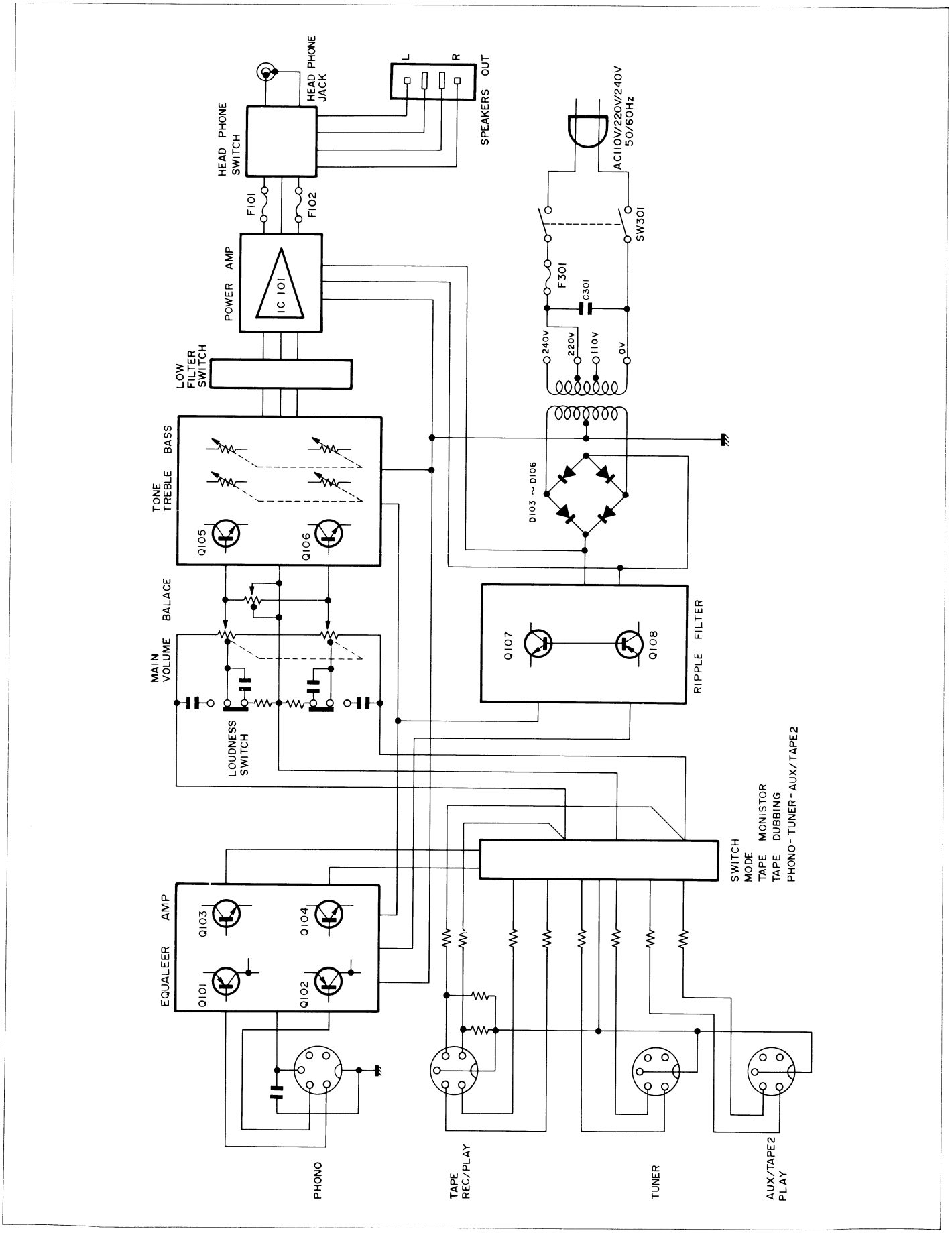


Figure 5

EQUALIZER CIRCUIT (Figure 6)

The equalizer circuit is of a two-stage directly coupled amplifier type having a higher gain and it can therefore remarkably lower the distortion factor. Being powered by a two-power supply (+20V and −20V), this circuit provides a better distortion factor characteristic even with a large amount of input. The incoming signal, from the phono input jacks, is fed through the coupling capacitor (C101 or C102) to the 1st-stage transistor (Q101 or Q102), then coming out of the 2nd-stage transistor (Q103 or Q104) to enter the function selector (SW201-C, D, E) via the coupling capacitor (C121 or C122). The equalizer NF circuit consists of R113, R117 thru R121, C107, C109, C111 and C117 thru R114, R118, R122, C108, C110, C112 and C118.

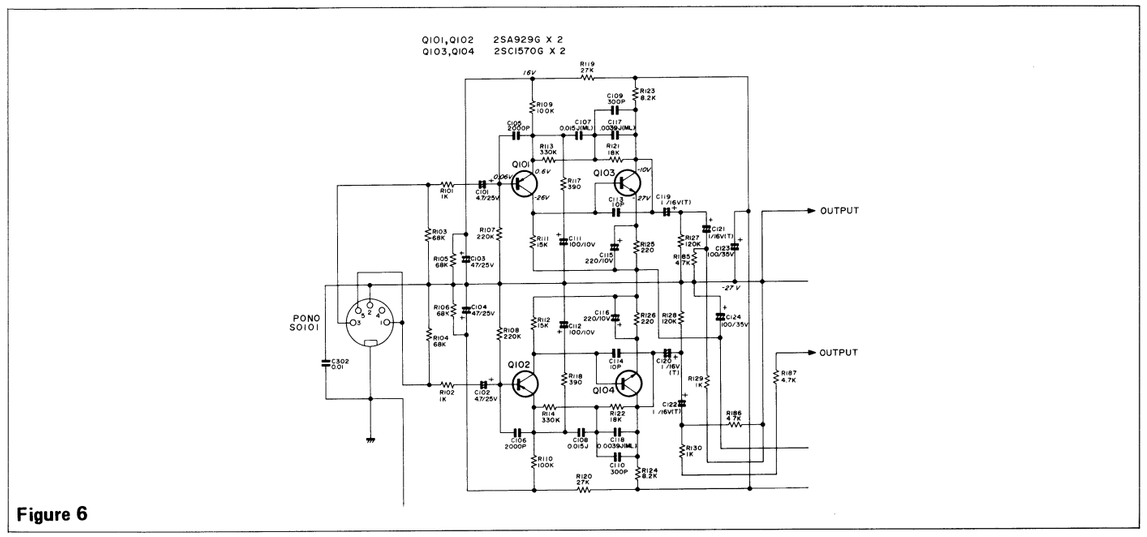


Figure 6

TONE CIRCUIT (Refer to Figure 7)

The tone circuit is an attenuator type circuit which comprises transistor (Q105 or Q106), capacitor and resistor.
Being an NPN low-noise type, the transistor (Q105 or Q106) ensures an outstanding signal-to-noise ratio. The signal coming from each of the function selectors (SW201) is passed on, through the volume control (VR301), balance control (VR101) and coupling capacitor (C129 or C130), to the base of the transistor (Q105 or Q106) where it is amplified. Besides, the frequency characteristic of the tone circuit may be varied by using the treble control (VR102) and bass control (VR103) to change the attenuation amount.

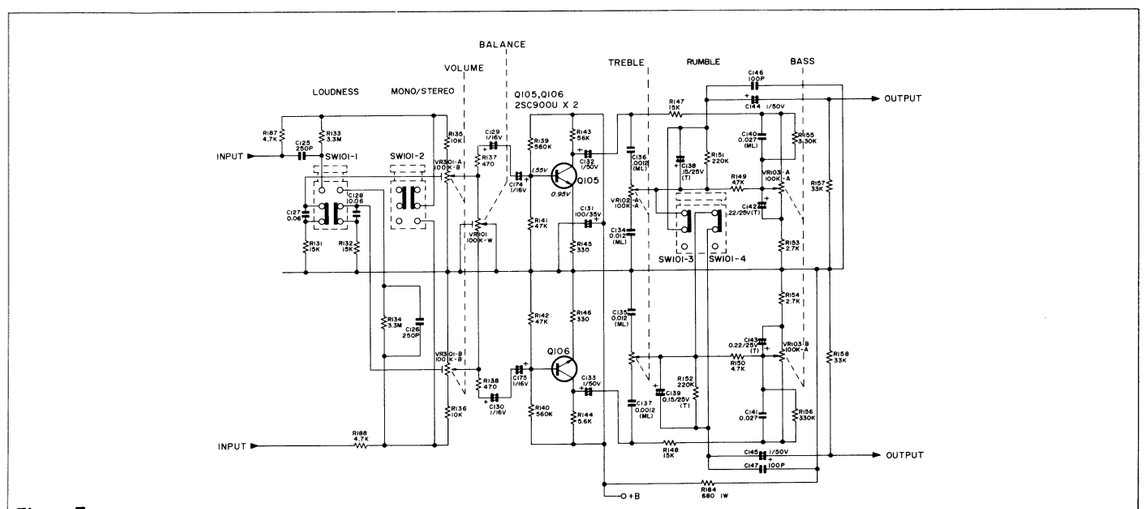


Figure 7

MAIN AMPLIFIER CIRCUIT (Refer to Figure 8)

The main amplifier circuit is a differential one-stage directly coupled, pure complementary dual IC which provides a very lowered distortion factor over a wide range of the band frequencies.
The circuit is initiated by a two-power supply (+31V and −31V) and the potential of output is kept to 0V. Coming from the tone circuit, the signal is applied through the coupling capacitor (C144 or C145) to the terminals ① and ⑯ of the IC, and coming out of the terminals ⑦ and ⑩, it is then further supplied to the speaker terminals (SO105A or SO105B) via the fuse (F101 or F102). The NR circuit is composed of resistors (R159 and R165, or R160 and R166) and capacitor (C148 or C149); the NF amount for the lower range is determined by the resistors (R159 and C148, or R160 and C149).

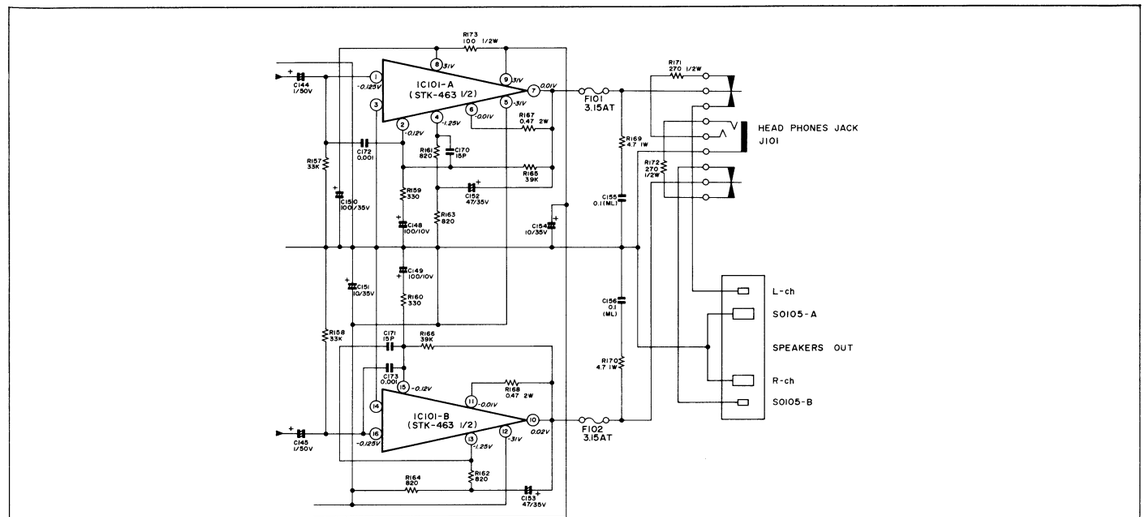


Figure 8

Figure 8

IC REPLACEMENT (Figure 9)

When replacing the power IC with a new one, firstly remove the two screws retaining the power IC and also the power IC's legs from the PWB. Next, sparingly apply silicone grease evenly over the metallic surface of a new power IC, bring the two screws through the retaining holes to fix them to the IC heat sink. After that, solder the IC's legs to the PWB.

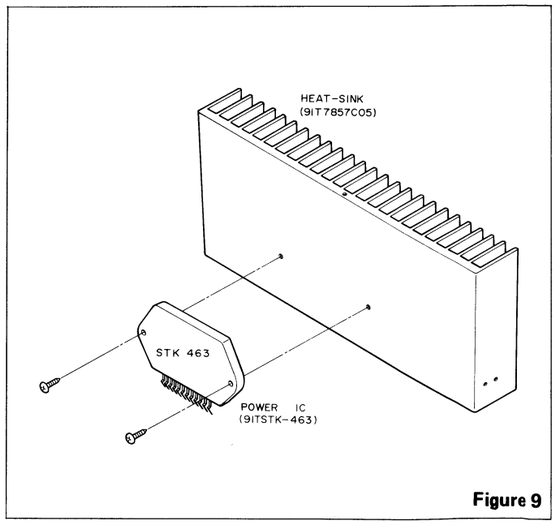


Figure 9

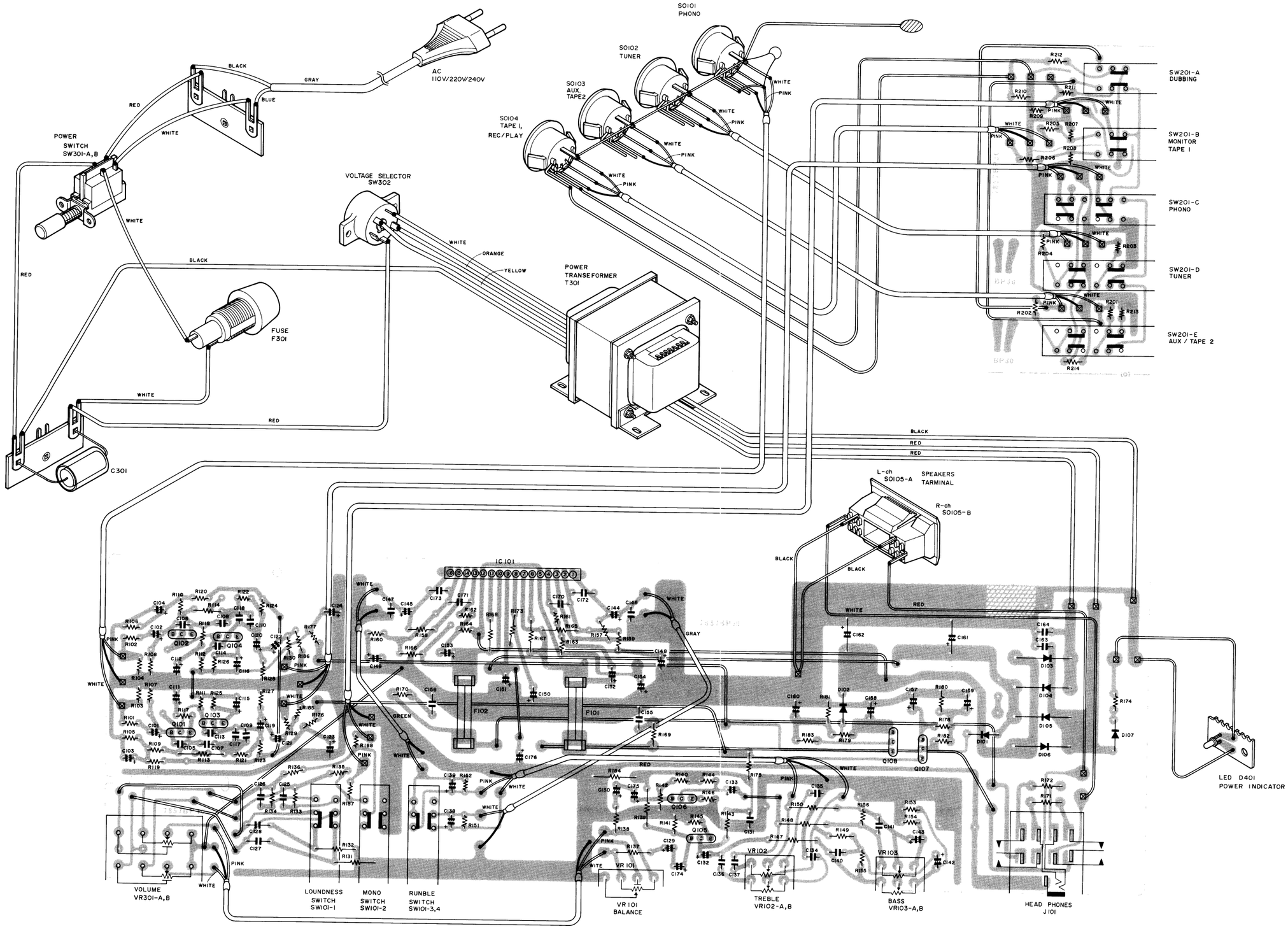
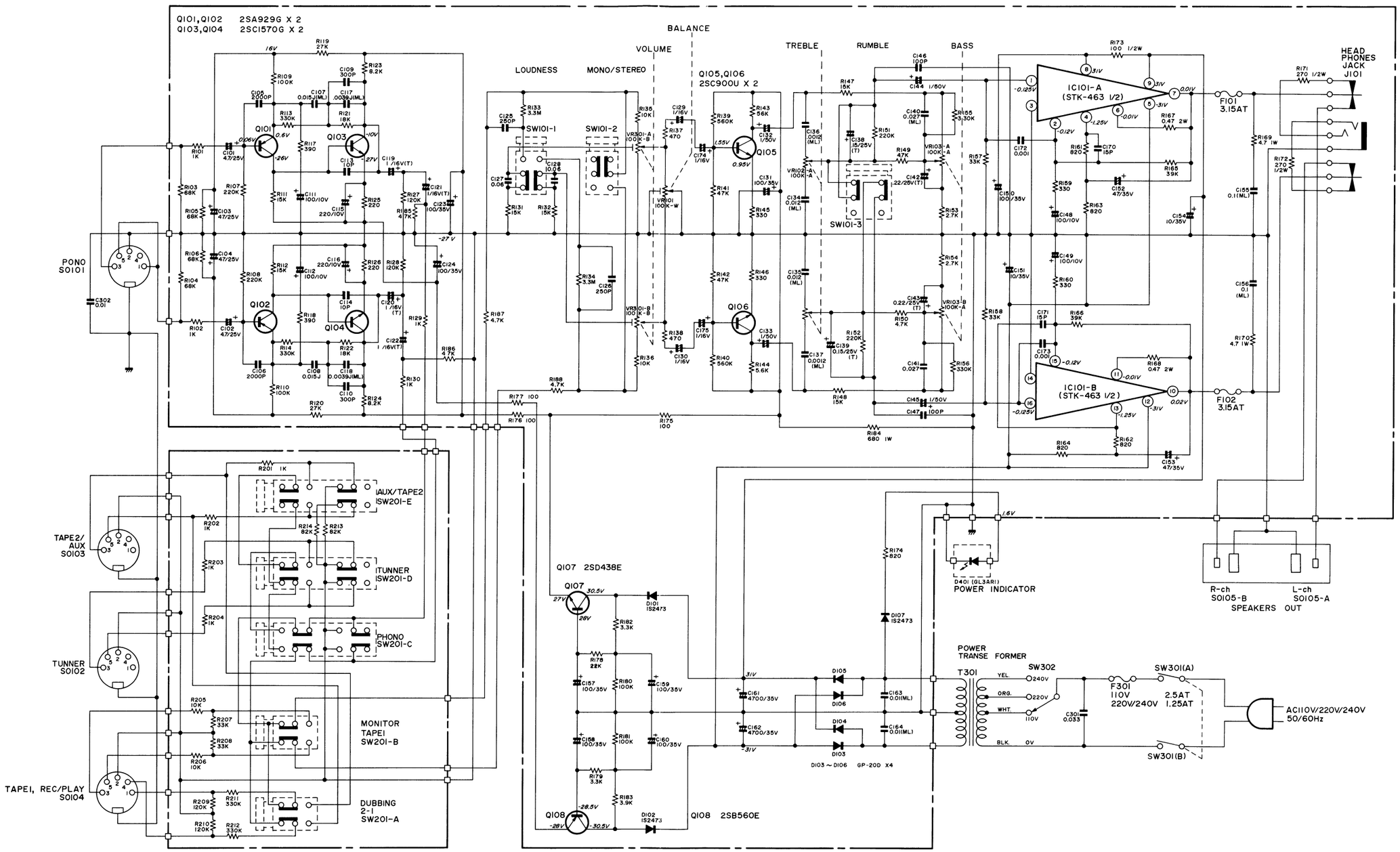


Figure 10 WIRING SIDE OF P.W. BOARD



SW. NO.	FUNCTION	POSITION	SW. NO.	FUNCTION	POSITION
SW101-3	RUMBLE	OFF - ON	SW201-B	MONITOR	OFF - ON
SW101-2	MODE	STEREO - MONO	SW201-C,D,E	SELECTOR	PHONO - TUNNER - AUX
SW101-1	LOUDNESS	OFF - ON	SW301(A),(B)	POWER	OFF - ON
SW201-A	DUBBING	OFF - ON			

NOTES

1. ALL RESISTORS ARE SHOWN IN OHMS ±5% 1/4W K=1000
2. ALL CAPACITORS ARE SHOWN IN MICROFARADS P=MMF
3. SWITCHES ARE SHOWN UNDERLINED POSITION.

Figure 11 SCHEMATIC DIAGRAM

VOLTAGE GUIDE OF P.W. BOARD

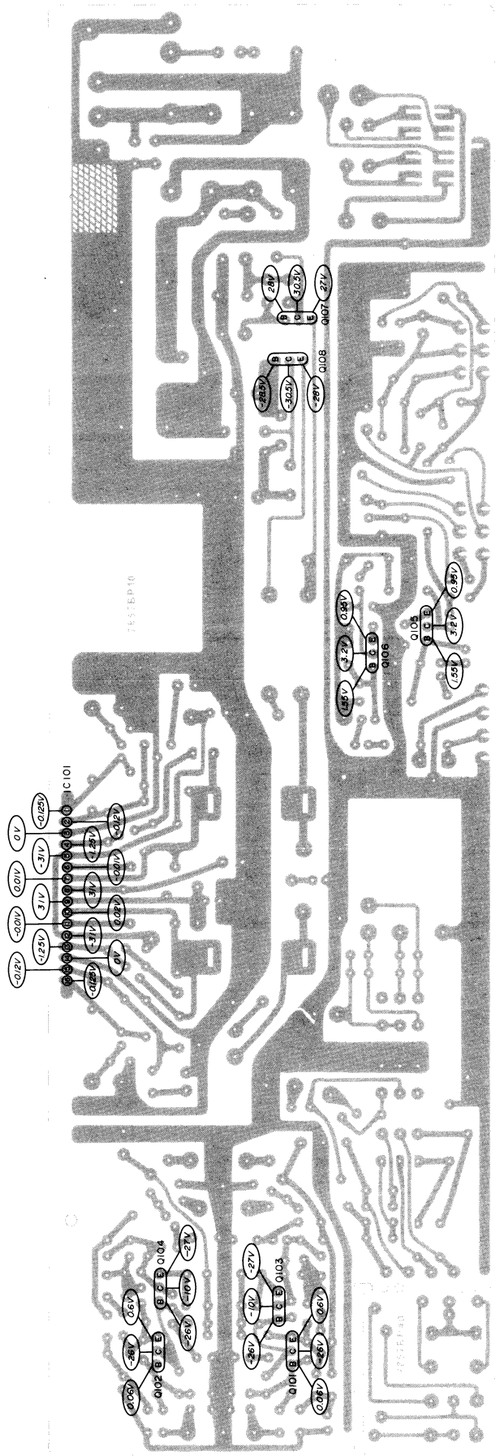


Figure 12

EQUIVALENT OF INTEGRATED CIRCUIT (Figure 13)

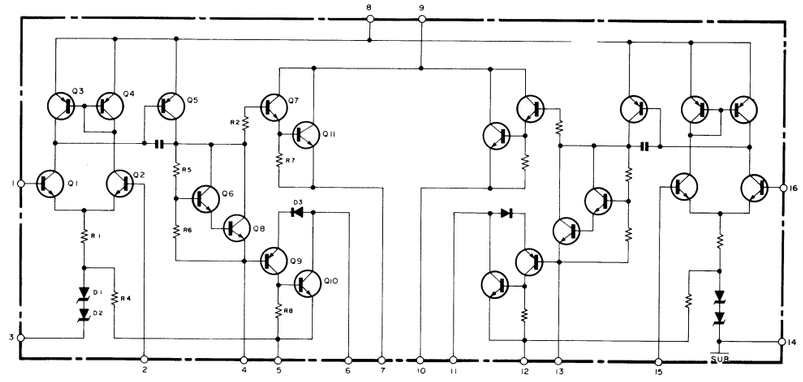


Figure 13

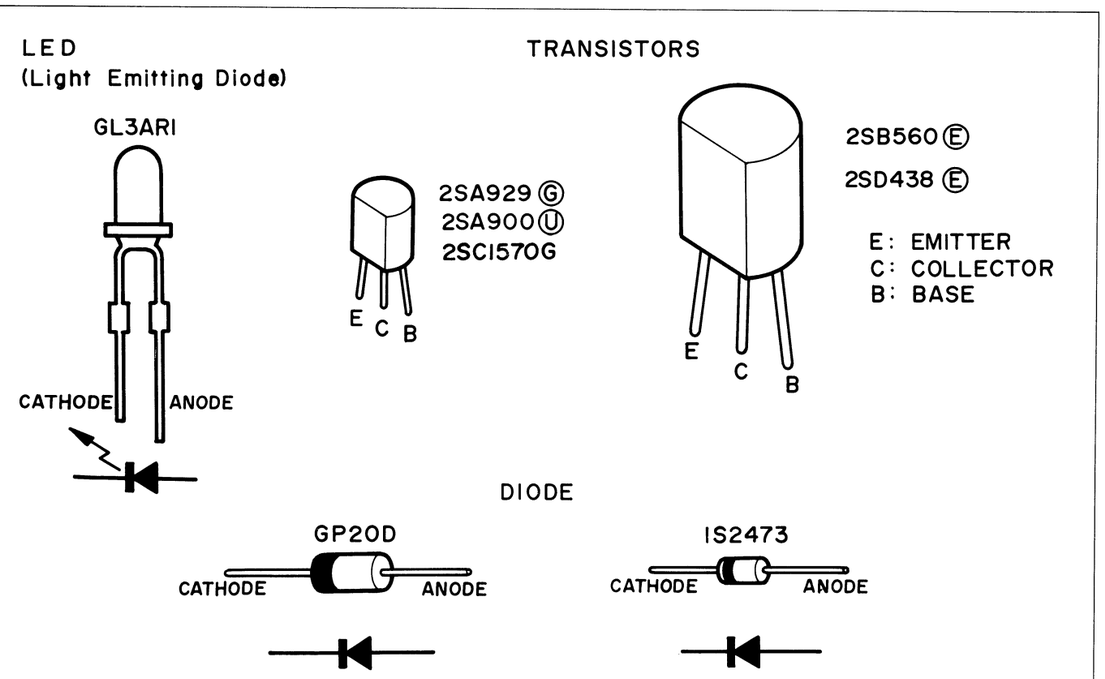


Figure 14

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION
	INTEGRATED CIRCUITS	
IC101	91TSTK463	Power Amp (STK463)
	TRANSISTORS	
Q101, Q102	91T2SA929G	Equalizer Amp (2SA929G)
Q103, Q104	91T2SC1570G	Equalizer Amp (2SC1570G)
Q105, Q106	91T2SC900U	Tone Amp (2SC900U)
Q107	91T2SD438E	Ripple Filter (2SD438E)
Q108	91T2SB560E	Ripple Filter (2SB560E)
	LED (Light Emitting Diode)	
D401	VHPGL3AR//-1	Power Indicator (GL3AR)
	DIODES	
D101, D102	91T1S2473	Ripple Filter Control
D103, D104, D105, D106	91TGP-20D	Power Rectifier
D107	91T1S2473	Detection L.E.D.
	TRANSFORMER	
T301	91TTA-148	Power
	CONTROLS	
VR101	91TRW-098	Balance Control
VR102	91TRW-097	Treble Control
VR103	91TRW-097	Bass Control
VR301	91TRW-114	Volume Control
	RESISTORS	
(Unless otherwise specified resistors are 1/4W, ±5%, carbon type.)		
R101, R102	91TRD14PY1KK	1K ohm
R103, R104	91TRD14PY68KK	68K ohm
R105, R106	91TRD14PY68KK	68K ohm
R107, R108	91TRD14PY220KK	220K ohm
R109, R110	91TRD14PY100K	100K ohm
R111, R112	91TRD14PY15KK	15K ohm
R113, R114	91TRD14PY330KK	330K ohm
R115, R116	91TRD14PY68KK	68K ohm
R117, R118	91TRD14PY390K	390 ohm
R119, R120	91TRD14PY27KK	27K ohm
R121, R122	91TRD14PY18KK	18K ohm
R123, R124	91TRD14PY8.2KK	8.2K ohm
R125, R126	91TRD14PY220K	220 ohm
R127, R128	91TRD14PY120KK	120K ohm
R129, R130	91TRD14PY1KK	1K ohm
R131, R132	91TRD14PY15KK	15K ohm
R133, R134	91TRD14PY3.3MK	3.3 Meg ohm
R135, R136	91TRD14PY10KK	10K ohm
R137, R138	91TRD14PY470K	470 ohm
R139, R140	91TRD14PY560KK	560K ohm
R141, R142	91TRD14PY47KK	47K ohm
R143, R144	91TRD14PY5.6KK	5.6K ohm
R145, R146	91TRD14PY330K	330 ohm
R147, R148	91TRD14PY15KK	15K ohm
R149, R150	91TRD14PY4.7KK	4.7K ohm
R151, R152	91TRD14PY220KK	220K ohm
R153, R154	91TRD14PY2.7KK	2.7K ohm
R155, R156	91TRD14PY330KK	330K ohm
R157, R158	91TRD14PY33KK	33K ohm
R159, R160	91TRD14PY330K	330 ohm
R161, R162	91TRD14PY820K	820 ohm

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
R163, R164	91TRD14PY820KK	820 ohm
R165, R166	91TRD14PY39KK	39K ohm
R167, R168	91TRD2PY.47K	.47 ohm, 2W, ±10%, Cement
R169, R170	91TRD11PY4.7K	4.7 ohm, 1W, ±10%, Carbon
R171, R172	91TRD12PY270K	270 ohm, 1/2W, ±10%, Carbon
R173	91TRF12PY100K	100 ohm, 1/2W, ±10%, Fusible
R174	91TRD14PY820K	820 ohm
R175, R176, R177	91TRD11PY100K	100 ohm
R178	91TRD14PY22KK	22K ohm
R179	91TRD14PY3.3KK	3.3K ohm
R180, R181	91TRD14PY100KK	100K ohm
R182	91TRD14PY3.3KK	3.3K ohm
R183	91TRD14PY3.9KK	3.9K ohm
R184	91TRD11PY680K	680 ohm, 1W, ±10%, Carbon
R185, R186	91TRD14PY47KK	47K ohm
R187, R188	91TRD14PY4.7KK	4.7K ohm
R201, R202, R203, R204	91TRD14PY1KK	1K ohm
R205, R206	91TRD14PY10KK	10K ohm
R207, R208	91TRD14PY33KK	33K ohm
R209, R210	91TRD14PY120KK	120K ohm
R211, R212	91TRD14PY330KK	330K ohm
R213, R214	91TRD14PY82KK	82K ohm

CAPACITORS

C105, C106	91TCK-202M	2000PF, 50V, ±20%, Ceramic
C107, C108	91TCMS-153J	.015MFD, 50V, ±5%, Mylar
C109, C110	91TCC-301K	300PF, 50V, ±10%, Ceramic
C113, C114	91TCC-100C	10PF, 50V, ±.25%, Ceramic
C117, C118	91TCMS-392J	.0039MFD, 50V, ±5%, Mylar
C125, C126	91TCK-251M	250PF, 50V, ±20%, Ceramic
C127, C128	91TCMS-602K	.06MFD, 50V, ±10%, Mylar
C134, C135	91TCMS-123K	.012MFD, 50V, ±10%, Mylar
C136, C137	91TCMS-122K	.0012MFD, 50V, ±10%, Mylar
C140, C141	91TCMS-273K	.027MFD, 50V, ±10%, Mylar
C146, C147	91TCC-101K	100PF, 50V, ±10%, Ceramic
C155, C156	91TCMS-104M	.1MFD, 50V, ±20%, Mylar
C163, C164	91TCMS-103K	.01MFD, 50V, ±10%, Mylar
C170, C171	91TCC-150C	15PF, 50V, ±.25%, Ceramic
C172, C173	91TCMS-102K	.001MFD, 50V, ±10%, Mylar
C301	91TCO-333M	.033MFD, 450V, ±20%, Ceramic
C302	91TCMS-103K	.01MFD, 50V, ±10%, Mylar

ELECTROLYTIC CAPACITORS

C101, C102	91TCDV-4.7/25M	4.7MFD, 25V, ±20%
C103, C104	91TCDV-47/25Y	47MFD, 25V, +50 −10%
C111, C112	91TCDV-100/10Y	100MFD, 10V, +50 −10%
C115, C116	91TCDV-220/10Y	220MFD, 10V, +50 −10%
C119, C120, C121, C122	91TCDV-1/16M	1MFD, 16V, ±20%
C123, C124	91TCDV-100/35Y	100MFD, 35V, +50 −10%
C129, C130	91TCDV-1/16M	1MFD, 16V, ±20%
C131	91TCDV-100/35Y	100MFD, 35V, +50 −10%
C132, C133	91TCFV-.15/25K	.15MFD, 25V, ±10%
C138, C139	91TCDV-1/50Y	1MFD, 50V, +50 −10%
C142, C143	91TCDV-.22/25M	.22MFD, 25V, ±20%
C144, C145	91TCDV-1/50Y	1MFD, 50V, +50 −10%
C148, C149	91TCDV-100/10Y	100MFD, 10V, +50 −10%
C150	91TCDV-100/35Y	100MFD, 35V, +50 −10%
C151	91TCDV-10/35Y	10MFD, 35V, +50 −10%
C152, C153	91TCDV-47/35Y	47MFD, 35V, +50 −10%
C154	91TCDV-10/35Y	10MFD, 35V, +50 −10%
C157, C158, C159, C160	91TCDV-220/35Y	220MFD, 35V, +50 −10%
C161, C162	91TCDV-4700/35Y	4700MFD, 35V, +50 −10%
C174, C175	91TCDV-1/16M	1MFD, 16V, ±20%

MISCELLANEOUS

F101, F102	91TZF-011	Fuse, 250V, 3.15AT
F301	91TZF-053	Fuse, 110V, 2.5AT 220V/240V, 1.25AT
J101	91TJH-007	Jack, Headphone

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
SO101	91TJV-006	DIN, Socket, PHONO
SO102	91TJV-006	DIN, Socket, TUNER
SO103	91TJV-006	DIN, Socket, AUX/TAPE 2
SO104	91TJV-006	DIN, Socket, TAPE 1 (REC/PLAY)
SO105 (A, B)	91TJV-007	Socket, Speakers
SW301 (A, B)	91TSP-103	Switch, Power
	91TZG-011	Fuse Holder
	91T7857BP100K	P.W. Board, Amp (P.W. Board only) (Not Available)
	91T7857BP200K	P.W. Board, Switch (P.W. Board only) (Not Available)
	91T7857BP300K	P.W. Board, L.E.D. (P.W. Board only) (Not Available)
	91T7857BP400K	P.W. Board, Volume (P.W. Board only) (Not Available)
	91TZA-050	AC Supply Cord
	91T7857A01	Front Panel (SM-1144H)
	91T7857A02	Knob, Volume (SM-1144H)
	91T7857A03	Knob, Bass/Treble/Balance (SM-1144H)
	91T7857A04	Panel, Volume
	91T7857A05	Cabinet
	91T7857A06	Rear Panel (SM-1144H)
	91T7857A07	Front Panel (SM-1144HB)
	91T7857A08	Knob, Volume (SM-1144HB)
	91T7857A09	Knob, Bass/Treble/Balance (SM-1144HB)
	91T7857A11	Rear Panel (SM-1144HB)
	91T7856A03	Knob, Power/AUX/TUNER/ TAPE/MODE/LOUDNESS DUBBING/PHONO/ RUMBLE (SM-1144H)
	91T7856A11	Knob, Power/AUX/TUNER/ TAPE/MODE/LOUDNESS/ DUBBING/PHONO/ RUMBLE (SM-1144HB)
	91T7857B01	Plate, Bottom
	91T7857C05	Heat-sink
	91T7857C01	Front Chassis
	91T7857C04	Bracket, Power Transformers
	91T7857C06	Bracket, Chassis
	91T7857C03	Bracket, Bottom Plate
	91T7717C02	Bracket, Side
	91T7717C10	Spring, Knob Volume
	91T7502C07	Shield Plate
	91T7717D01	Leg
	91T3361D04	Bushing
	91TLA-016	Lug, Terminal
	91T7857F01	Packing Case (SM-1144H)
	91T7857F02	Packing Case (SM-1144HB)
	91T7717F02	Packing Add.
SW201 (A~E)	91TSP-126	Switch, AUX, TAPE 2/TUNER/ PHONO/TAPE/DUBBING
SW101 (1~3)	91TSP-125	Switch, Loudness/Mode/ Rumble
SW302	91TSQ-058	Voltage selector
	91T7857B02	Sleeve, DUBBING/AUX/ TAPE1, PHONO, TUNER (SM-1144H)
	91T7857B04	Sleeve, DUBBING/AUX/ TAPE1, PHONO, TUNER (SM1144HB)
	91T7857B03	Sleeve, RUMBLE/MODE/ LOUDNESS (SM-1144H)
	91T7857B05	Sleeve, RUMBLE/MODE/ LOUDNESS (SM-1144HB)
	91T7857D01	Plate, Voltage Selector
	91T7857C07	Bracket, Heat-sink
	91T7718C07	Bracket, Chassis